Does local expenditure composition matter? Brazilian HDI and regional living conditions standards

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1. Introduction

The last decentralization process in Brazilian fiscal federalism was legally launched in 1988, when the new federal constitution passed. A considerable part of main public services competencies were assigned concurrently to local governments, which are supposed to perform these tasks relying on the financial and technical support from the federation. A large share of the national tax revenues was granted to these jurisdictions, directly or by means of transferences. The higher level of local revenues were not initially translated, however, into better standards of public services, due to a lack of coordination between states and federal government, in addition to technical and administrative local level deficiencies.

Over the 1990´s the institutional framework underlying Brazilian intergovernmental relations experienced important changes that seek to strength vertical coordination between municipalities and the state/national governments. A variety of new rules were gradually introduced. These rules intended mainly to establish the specific role of each government level for each kind of public service. By 2000 a whole new institutional environment were built. Health care and education programs were the main targets of these changes and it was in these areas that institutionalization of intergovernmental relations went further. Grants on these areas were constitutionally established by constitutional amendments. And, enforcement rules adopted. The aim was to guarantee better quality and access to public services.

From one theoretical perspective these changes should improve public services by introducing new monitoring mechanisms. From another these changes limit local

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government autonomy and hinder local governments capacity to develop policies suitable to local conditions. The arguments in favor of each position are not conclusive and the dilemma is long known in fiscal federalism literature.

The question to be addressed by this paper concerns the relation between the centralization trend of Brazilian fiscal federalism structure as represented by the changes pointed above and the potential for diminishing regional disparities. The hypothesis to be tested is that the greater control by federation over the delivery of local public services may improve public services quality as a whole but does not necessarily favours the convergence on living conditions between regions.

To do that it will be first presented the main changes occurred on the patterns of public financing and spending, which were determined by institutional changes that took place during the 90´s. Next it will be discussed the shifts on HDI between 1991 and 2000. Finally, it will be established the relations between HDI and fiscal strucuture.

2. Institutional Changes

Along the 90´s two main changes occurred on Brazilian federal fiscal structure. The first was on education policy with the creation of FUNDEP in 1996 a fund to support elementary public school and the second on health care policy with the introduction of a series of measures to institutionalize financing and spending in this area. By 2000 many of these measures were implemented and a number of others were on the way. To fully understand the impact of these changes it is necessary to explain what they are and what their goals were.

2.1. Education Policy - Fundef

Fundef was created to improve the quality of elementary school in Brazil. It is a fund to maintain and develop the elementary school and to attribute more value to the teachers work. It was introduced by a constitutional amendment on September 14, 1996 and established that 15% of the constitutional transferences from the union and states to states and municipios. It was implemented on January 1, 1998

Constitutional transferences to municipios in Brazil are composed by 25% of 5 sources: the fund of states' participation (FPE), the fund of municipios' participation (FPM), a share of the states' value added tax (ICMS), a share of industrialized products tax (IPI) and the export alleviation compensation (Law n 87/96). In addition the federal government also transfers another amount of resources as to attain the minimum amount per student established annually that is called Union Compensation. Since 1999 the minimum amount per student is calculated based on a research about student costs. The Ministry of Finance based on each municipio tax collection calculates the necessary compensation to the municipios where tax collection does not guarantee the minimum amount per student. Each municipio transference share is estimated based on student enrollment. According to the Education Ministry since 1998 something like 1,5% of the Brazilian GDP has been spent in elementary education. It is important to stress that constitutional transferences are automatic and regularly attributed to municipios and states. With the introduction of FUNDEF part of the constitutional transferences became earn-market although there is still some margin of discretion on spending concerning amounts and selection of items. The rules of FUNDEF spending are quite explicit. At least 60% of annual amount transferred should be utilized to pay teachers. This is part of the logic of increasing the value attributed to teachers by better paying then. The other 40% could be spent in a variety of items like building construction and repair, equipment buying, research on education, other activities connected to elementary school. The expected results were an improvement in literacy standards. The HDIE measures the degree of education pattern and will be used to ascertain the impact of the introduction of FUNDEF.

2.2. Health Care Policy - SUS

Health care policy went to changes deeper than education policy during the 90´s. The 1988 SUS (Unified Health System) was created in order to implement the 1988 Constitution determination that health care services are universally accessible to Brazilian population and that health services are joint responsibility of

three levels of government. However, only in 1996 it was determined how the coordination between levels of government would be implemented. The NOB-SUS/1996 (Unified Health System Basic Operational Norms) laid the basis for health policy that has been followed since then. It established that delivery of public health care services would mainly be municipios responsibility but that financing responsibility will mainly be federal. To do that it was create the National Health Care Fund that is the unit responsible to transfer resources to states and municipios. Two main kinds of transferences were established. The first transference aims to provide means to the delivery of basic health care and it is given to municipios on a per capita basis. It includes a basic assistance floor (PAB) and foresees increases on the floor depending on the existence and extension of other programs as the family health care program (PSF) or the community health care agents program (PACS). The second one endeavors to improve quality and accessibility for average and high complexity health care services. In this case transferences have been done on a fee-for-service base, according to the need of the service. This transference distribution is decided annually first by a commission composed of all states where the share of each state is determined and then by municipios commissions in each state when the share of each municipio is set. It was supposed that states as well as municipios should share with federal government the financing of public health care however until 2000 it was not explicit determined what should states and municipios shares be. In 2000 it was approved a Constitutional Amendment that render compulsory the spending of 7% of states and municipios revenues on health care services.

2.3. Institutional Fiscal Structure Change and Fiscal Federalism

The changes mentioned above are typical changes on federal fiscal relations between levels of government. The literature on fiscal federalism or fiscal federal relations[2] can offer us some hypothesis to be tested concerning the expected

[2] See Bird (19)

results of these modifications. These hypotheses are not necessarily consistent among then.

First it is possible to say that reducing local level autonomy could be bad to the delivery of public services as long as the demands of local community are better known by local administration. FEUNDEF is a typical case of that kind given that it determines that part of revenues that once were not earn market became so.

On the other hand it can be said also with the support of the literature that the increase of earn-market revenues could prevent resources bad use by local level politicians who seek to provide services with the maximum probability of producing votes.

It is important to observe that none of the above mentioned changes are perfect in terms of preventing local government administration from breaking contracts at least in part and doing what it is decided by local politicians. Anyway supposing that contracts are complete it is possible to maintain both hypotheses what is quite conflicting.

Another hypothesis that could be put forward is that transference revenue increase could be responsible for worsening public services delivery once local administration could always blame federal or state administration for not having released the resources on time or for transferring not enough resources. It is also usually asserted that it diminishes the incentives to get own revenue loosing opportunities to increase total public revenue.

On the other hand considering countries with a huge regional income disparity like Brazil it is possible to say that transferences from federal or state levels to state or local levels are the only probable way to deliver adequate public services at local level.

These last two hypotheses also point to conflicting results. To ascertain which of the expected results are more probable it will be relate public services delivery indicators to the fiscal regional structure patterns.

3. HDI and Regional Disparities

Human development indexes – HDI, are good indicators for regional differences. As it includes indicators for living standards as education and health along with income it allows observing shifts in living conditions that may not be directly related to income. Table 1 presents HDI for 1991 and 2000 by Brazilian regions. HDIs were calculated for three categories: overall, education, health and income. The most interesting feature that could be observed in his table is the increase in all HDIs for all regions between 1991 and 2000.

Table 1.
Brazilian HDI by region
1991 and 2000

Region	HDI Means				
	North	Nortest	Southest	South	Center-West
HDI91	0,5768	0,5025	0,6696	0,6913	0,6512
HDI00	0,6636	0,6103	0,7449	0,7705	0,7368
HDIE91	0,6018	0,5016	0,7161	0,7559	0,6965
HDIE00	0,7552	0,6905	0,8203	0,8603	0,8220
HDIL91	0,6051	0,5553	0,6886	0,7124	0,6521
HDIL00	0,6787	0,6356	0,7543	0,7764	0,7324
HDII91	0,5235	0,4508	0,6040	0,6058	0,6049
HDII00	0,5569	0,5048	0,6602	0,6750	0,6561

HDI percentage changes could be seen on Graph 1. Northeast was the region that improved most its HDI. The biggest changes occurred in education HDI what suggests that FUNDEP expenditures should have contributed to this improvement. The smallest changes occurred in HDI income.

Graph 1.
HDI Changes, 1991-2000

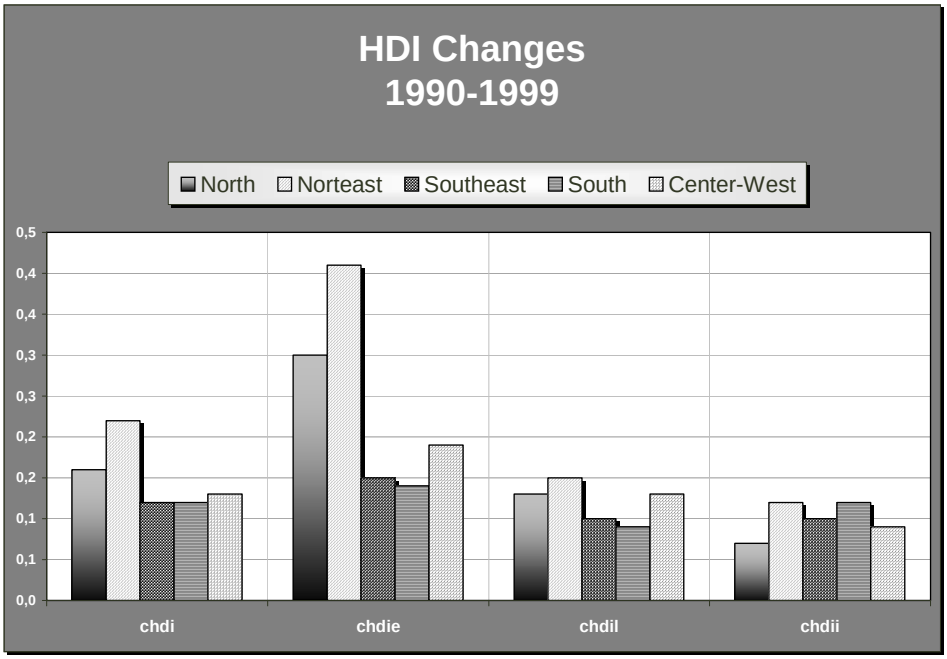


Table 2 depicts the HDI differences between regions by comparing each one to the South Region that is the one that displays the highest levels for all HDIs. Although there are still huge differences in HDI values between regions it is possible to see that some of them have been diminishing during the period. Except for Southeast region all the other increased their HDIs and got near to South region and even nearer to Southeast region. On the other hand differences in HDI for income have augmented for all regions comparing to South region. It is an interesting result because it suggests that shifts in living standards HDI are not directly related to income.

Table 2.
HDI Compared to South Region
1991-2000

	North	Norteast	Southest	South	Center-West
HDI91	0,1146	0,1888	0,0218	0,0000	0,0402
HDI00	0,1069	0,1602	0,0256	0,0000	0,0337
HDIE91	0,1540	0,2543	0,0397	0,0000	0,0593
HDIE00	0,1051	0,1698	0,0400	0,0000	0,0382
HDIL91	0,1073	0,1571	0,0237	0,0000	0,0603
HDIL00	0,0976	0,1408	0,0221	0,0000	0,0439
HDII91	0,0823	0,1550	0,0018	0,0000	0,0008
HDII00	0,1182	0,1702	0,0149	0,0000	0,0190

These data suggest that it is advisable to test for mean differences between regions and also for some kind of convergence among them. Table 3 presents the mean differences tests results. What is possible to observe is that in 1991 regions Southeast (3), South (4) and Center-West (5) had HDI Income means that could be considered equal among them. For all the other regions/variables means were significantly different. In 2000 only Southeast and Center-West displayed equal means. This result suggests that even though HDI differences have lessened, regional disparities are still big and do not seem to be diminishing.

It is quite possible that these results had been influenced by the changes is fiscal structure discussed above. Before relate fiscal structure to HDIs is it interesting to highlight some fiscal characteristics.

Table 3.
HDI Mean Differences

Multiple Comparisons
LSD

Dependent Variable	(I) REG	(J) REG	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Lower Bound	95% Confidence Upper Bound	Dependent Variable	(I) REG	(J) REG	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Lower Bound	95% Confidence Upper Bound
IDH91	1	2	0,074	0,003	0,000	0,068	0,080	IDH00	1	2	0,053	0,003	0,000	0,048	0,058
		3	-0,093	0,003	0,000	-0,099	-0,087			3	-0,081	0,003	0,000	-0,087	-0,076
		4	-0,115	0,003	0,000	-0,121	-0,108			4	-0,107	0,003	0,000	-0,112	-0,102
		5	-0,074	0,004	0,000	-0,082	-0,067			5	-0,073	0,003	0,000	-0,080	-0,067
	2	1	-0,074	0,003	0,000	-0,080	-0,068		2	1	-0,053	0,003	0,000	-0,058	-0,048
		3	-0,167	0,002	0,000	-0,171	-0,163			3	-0,135	0,002	0,000	-0,138	-0,131
		4	-0,189	0,002	0,000	-0,193	-0,184			4	-0,160	0,002	0,000	-0,164	-0,157
		5	-0,149	0,003	0,000	-0,155	-0,142			5	-0,127	0,003	0,000	-0,132	-0,121
	3	1	0,093	0,003	0,000	0,087	0,099		3	1	0,081	0,003	0,000	0,076	0,087
		2	0,167	0,002	0,000	0,163	0,171			2	0,135	0,002	0,000	0,131	0,138
		4	-0,022	0,002	0,000	-0,026	-0,017			4	-0,026	0,002	0,000	-0,029	-0,022
		5	0,018	0,003	0,000	0,012	0,025			5	0,008	0,003	0,002	0,003	0,013
	4	1	0,115	0,003	0,000	0,108	0,121		4	1	0,107	0,003	0,000	0,102	0,112
		2	0,189	0,002	0,000	0,184	0,193			2	0,160	0,002	0,000	0,157	0,164
		3	0,022	0,002	0,000	0,017	0,026			3	0,026	0,002	0,000	0,022	0,029
		5	0,040	0,003	0,000	0,034	0,047			5	0,034	0,003	0,000	0,028	0,039
	5	1	0,074	0,004	0,000	0,067	0,082		5	1	0,073	0,003	0,000	0,067	0,080
		2	0,149	0,003	0,000	0,142	0,155			2	0,127	0,003	0,000	0,121	0,132
		3	-0,018	0,003	0,000	-0,025	-0,012			3	-0,008	0,003	0,002	-0,013	-0,003
		4	-0,040	0,003	0,000	-0,047	-0,034			4	-0,034	0,003	0,000	-0,039	-0,028
IDHE91	1	2	0,100	0,005	0,000	0,091	0,109	IDHE00	1	2	0,065	0,003	0,000	0,058	0,071
		3	-0,114	0,005	0,000	-0,124	-0,105			3	-0,065	0,003	0,000	-0,071	-0,059
		4	-0,154	0,005	0,000	-0,164	-0,144			4	-0,105	0,003	0,000	-0,112	-0,099
		5	-0,095	0,006	0,000	-0,106	-0,083			5	-0,067	0,004	0,000	-0,075	-0,059
	2	1	-0,100	0,005	0,000	-0,109	-0,091		2	1	-0,065	0,003	0,000	-0,071	-0,058
		3	-0,215	0,003	0,000	-0,220	-0,209			3	-0,130	0,002	0,000	-0,134	-0,126
		4	-0,254	0,003	0,000	-0,261	-0,248			4	-0,170	0,002	0,000	-0,174	-0,165
		5	-0,195	0,005	0,000	-0,204	-0,186			5	-0,132	0,003	0,000	-0,138	-0,125
	3	1	0,114	0,005	0,000	0,105	0,124		3	1	0,065	0,003	0,000	0,059	0,071
		2	0,215	0,003	0,000	0,209	0,220			2	0,130	0,002	0,000	0,126	0,134
		4	-0,040	0,003	0,000	-0,046	-0,033			4	-0,040	0,002	0,000	-0,044	-0,035
		5	0,020	0,005	0,000	0,010	0,029			5	-0,002	0,003	0,591	-0,008	0,005
	4	1	0,154	0,005	0,000	0,144	0,164		4	1	0,105	0,003	0,000	0,099	0,112
		2	0,254	0,003	0,000	0,248	0,261			2	0,170	0,002	0,000	0,165	0,174
		3	0,040	0,003	0,000	0,033	0,046			3	0,040	0,002	0,000	0,035	0,044
		5	0,059	0,005	0,000	0,050	0,069			5	0,038	0,003	0,000	0,032	0,045
	5	1	0,095	0,006	0,000	0,083	0,106		5	1	0,067	0,004	0,000	0,059	0,075
		2	0,195	0,005	0,000	0,186	0,204			2	0,132	0,003	0,000	0,125	0,138
		3	-0,020	0,005	0,000	-0,029	-0,010			3	0,002	0,003	0,591	-0,005	0,008
		4	-0,059	0,005	0,000	-0,069	-0,050			4	-0,038	0,003	0,000	-0,045	-0,032
IDHL91	1	2	0,050	0,003	0,000	0,044	0,056	IDHL00	1	2	0,043	0,003	0,000	0,037	0,049
		3	-0,084	0,003	0,000	-0,090	-0,078			3	-0,076	0,003	0,000	-0,081	-0,070
		4	-0,107	0,003	0,000	-0,114	-0,101			4	-0,098	0,003	0,000	-0,104	-0,092
		5	-0,047	0,004	0,000	-0,054	-0,040			5	-0,054	0,004	0,000	-0,061	-0,046
	2	1	-0,050	0,003	0,000	-0,056	-0,044		2	1	-0,043	0,003	0,000	-0,049	-0,037
		3	-0,133	0,002	0,000	-0,137	-0,130			3	-0,119	0,002	0,000	-0,122	-0,115
		4	-0,157	0,002	0,000	-0,161	-0,153			4	-0,141	0,002	0,000	-0,145	-0,137
		5	-0,097	0,003	0,000	-0,103	-0,091			5	-0,097	0,003	0,000	-0,103	-0,091
	3	1	0,084	0,003	0,000	0,078	0,090		3	1	0,076	0,003	0,000	0,070	0,081
		2	0,133	0,002	0,000	0,130	0,137			2	0,119	0,002	0,000	0,115	0,122
		4	-0,024	0,002	0,000	-0,028	-0,019			4	-0,022	0,002	0,000	-0,026	-0,018
		5	0,037	0,003	0,000	0,031	0,043			5	0,022	0,003	0,000	0,016	0,028
	4	1	0,107	0,003	0,000	0,101	0,114		4	1	0,098	0,003	0,000	0,092	0,104
		2	0,157	0,002	0,000	0,153	0,161			2	0,141	0,002	0,000	0,137	0,145
		3	0,024	0,002	0,000	0,019	0,028			3	0,022	0,002	0,000	0,018	0,026
		5	0,060	0,003	0,000	0,054	0,067			5	0,044	0,003	0,000	0,038	0,050
	5	1	0,047	0,004	0,000	0,040	0,054		5	1	0,054	0,004	0,000	0,046	0,061
		2	0,097	0,003	0,000	0,091	0,103			2	0,097	0,003	0,000	0,091	0,103
		3	-0,037	0,003	0,000	-0,043	-0,031			3	-0,022	0,003	0,000	-0,028	-0,016
		4	-0,060	0,003	0,000	-0,067	-0,054			4	-0,044	0,003	0,000	-0,050	-0,038
IDHR91	1	2	0,073	0,004	0,000	0,066	0,080	IDHR00	1	2	0,052	0,003	0,000	0,046	0,058
		3	-0,081	0,004	0,000	-0,087	-0,074			3	-0,103	0,003	0,000	-0,110	-0,097
		4	-0,082	0,004	0,000	-0,090	-0,075			4	-0,118	0,003	0,000	-0,125	-0,111
		5	-0,081	0,004	0,000	-0,090	-0,073			5	-0,099	0,004	0,000	-0,107	-0,091
	2	1	-0,073	0,004	0,000	-0,080	-0,066		2	1	-0,052	0,003	0,000	-0,058	-0,046
		3	-0,153	0,002	0,000	-0,158	-0,149			3	-0,155	0,002	0,000	-0,159	-0,151
		4	-0,155	0,003	0,000	-0,160	-0,150			4	-0,170	0,002	0,000	-0,175	-0,166
		5	-0,154	0,004	0,000	-0,161	-0,147			5	-0,151	0,003	0,000	-0,158	-0,145
	3	1	0,081	0,004	0,000	0,074	0,087		3	1	0,103	0,003	0,000	0,097	0,110
		2	0,153	0,002	0,000	0,149	0,158			2	0,155	0,002	0,000	0,151	0,159
		4	-0,002	0,003	0,489	-0,007	0,003			4	-0,015	0,002	0,000	-0,019	-0,010
		5	-0,001	0,004	0,793	-0,008	0,006			5	0,004	0,003	0,207	-0,002	0,011
	4	1	0,082	0,004	0,000	0,075	0,090		4	1	0,118	0,003	0,000	0,111	0,125
		2	0,155	0,003	0,000	0,150	0,160			2	0,170	0,002	0,000	0,166	0,175
		3	0,002	0,003	0,489	-0,003	0,007			3	0,015	0,002	0,000	0,010	0,019
		5	0,001	0,004	0,823	-0,006	0,008			5	0,019	0,003	0,000	0,012	0,026
	5	1	0,081	0,004	0,000	0,073	0,090		5	1	0,099	0,004	0,000	0,091	0,107
		2	0,154	0,004	0,000	0,147	0,161			2	0,151	0,003	0,000	0,145	0,158
		3	0,001	0,004	0,793	-0,006	0,008			3	-0,004	0,003	0,207	-0,011	0,002
		4	-0,001	0,004	0,823	-0,008	0,006			4	-0,019	0,003	0,000	-0,026	-0,012

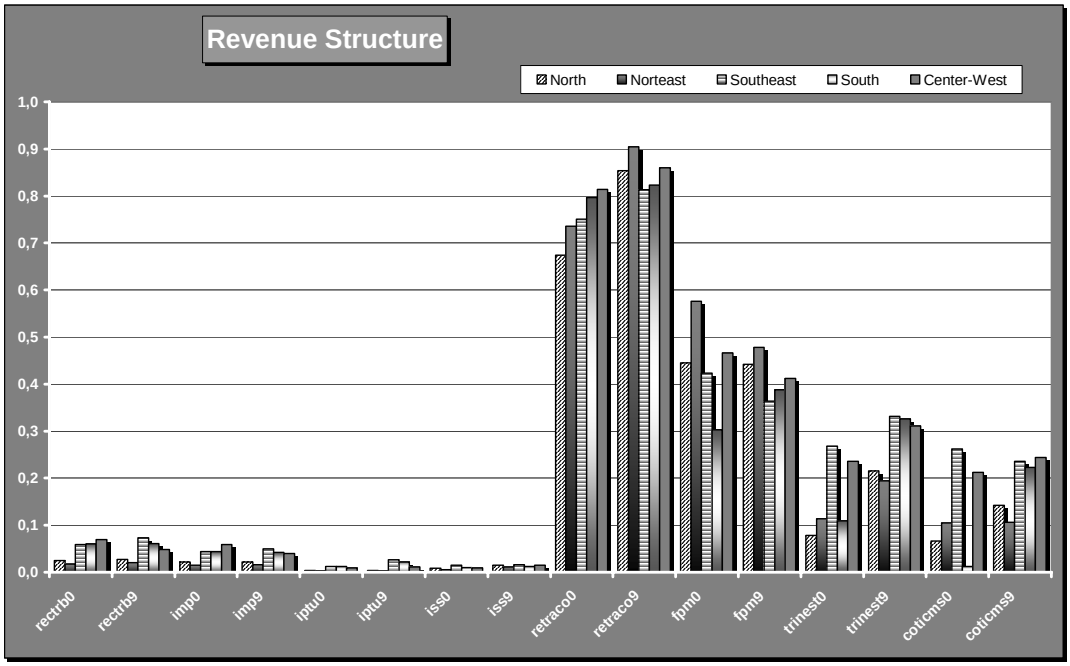
4. Regional Patterns of Public Revenues and Expenditures

There are a few features on Brazilian fiscal structure that are worth mentioned for this paper purposes. Contrary to what happens in the majority of federations in the world Brazilian Constitution considers municipios as federal entities in the same level as the Union and the states. This means that municipios are politically as autonomous as states and Union. Even though constitution attributes this status to municipios in reality they are not as autonomous as it could suggest. Taken into account the whole country only 4.4% in 1990 and 5.1% of local budget revenues were taxes revenues. On the other hand transferences corresponded to 75.6% in 1990 and 84.5% in 1999. Municipios received federal and state transferences. The most important transference is FPM that corresponded to 45.5% in 1990 and 40.8% in 1999 of total budget revenues. The FPM share lost from 1990 to 1999 should be related to the new transferences mentioned on item 2. The dependency from states is not negligible. States transferences to municipios were 17.1% of total budget revenues in 1990 and 28.4% in 1999.

Regional patterns of public revenues are not all too uniform considering the extremely similar role that the Constitution assign to each level of government. The main reason that explains regional differences in public budget composition is probably income level. However it is possible to observe some patterns that could not be accounted for solely by income. Graph 2 displays the regional revenues structure. Although transferences are extremely important in all regions they respond for a higher share of budget revenues their regional pattern changed a little between 1990 and 1999. In 1990 South and Center-West regions transferences were the biggest share of their budget among regions. In 1999, their position changed and North and Northeast regions were the ones to exhibit the greatest transferences share of budget revenues. The Northeast, South and Center-West regions transferences increases were mainly due to state transferences. It suggests that transferences trends are in accordance to decreasing regional disparities policy. It is also possible to observe that tax

revenues increased a little in Southeast region. So it is easy to see that some important changes occurred. All regions are now relying more on transferences but some are more than others. For 1990 it is not available all the revenues items that exists for 1999. However is important to take a look on the items that appear in 1999.

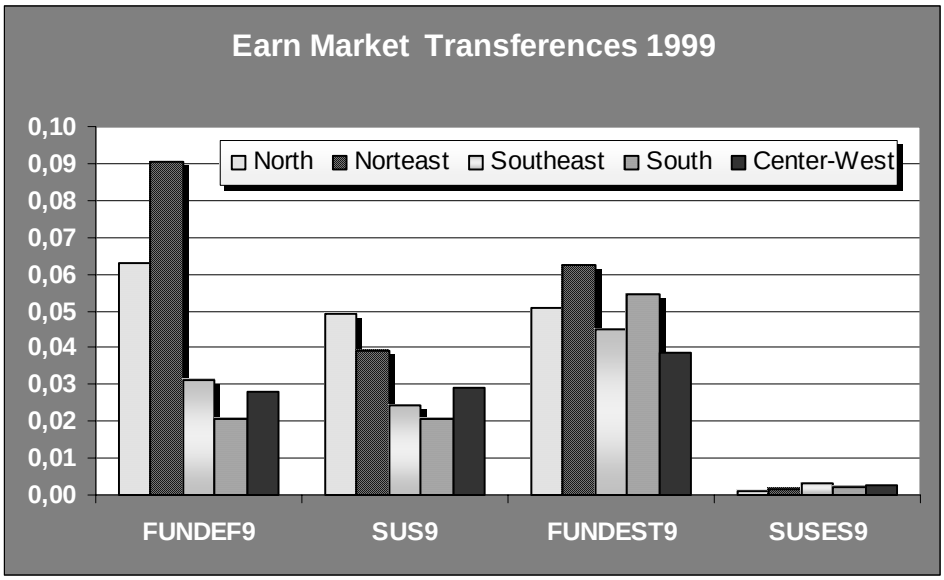
Graph 2.



Graph 3 shows the shares of the most important earn-market transferences from union and states to municipios. As is possible to perceive states transferences to local levels are much more important in South and Southeast regions than in North and Northeast regions. This graph also suggests that union transferences are playing the role of diminish regional disparities. At the same time states on the wealthier regions seems to be much more aware of their responsibility in favoring

good public services delivery sharing a significant amount of their revenues with local levels specially to provide education.

Graph 3.

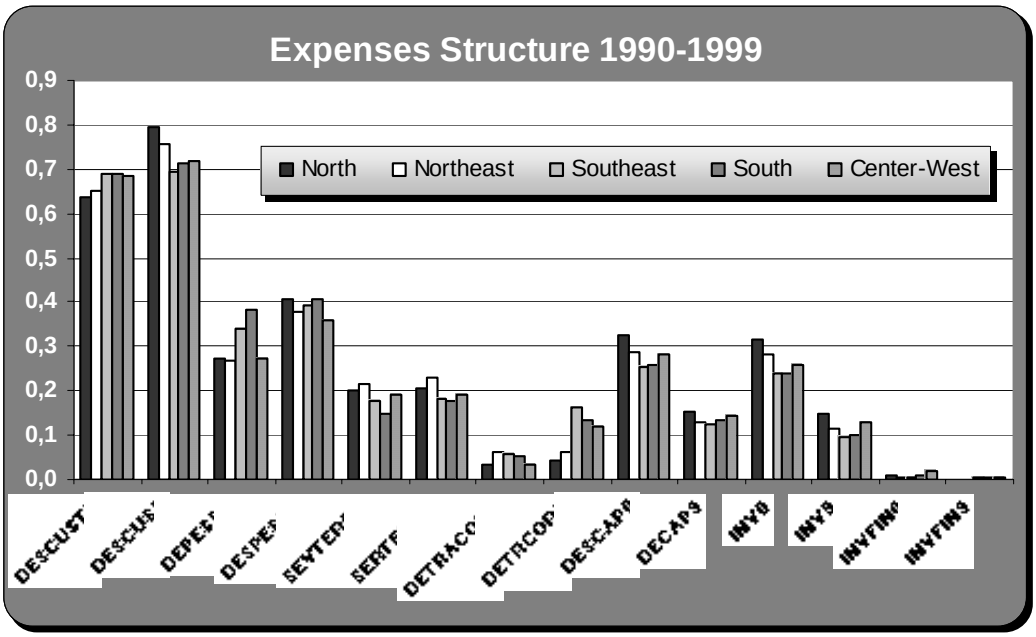


Expenses structure also changed during this period. Unfortunately there is no available data about spending by function. The only information it is possible to obtain is spending by kind. Graph 4 depicts this information. Along the period considered current expenses grew in comparison to capital expenses. It may indicate that indebtness diminished. Personal expenses also increased in all regions. The increase in labor expenses could be attributable to the increase in education and health car services what is consistent with the creation of FUNDEF and SUS. On the other hand investment expenses decreased considerably.

Regional patterns show some differences. In North and Southeast regions current expenses grew much faster than in other regions. This growth is mainly explained by personal expenses increase. Another important difference was the larger

increase in transferences expenses in Southeast, South and Center-West regions. This should be attributed to SUS transferences between local levels.

Graph 4.



So far there has been pointed that fiscal structure and HDIs trends have showed patterns that could not be explained only by income shifts. So it seems that there is room to try to explain some of the HDI shifts by fiscal structure arrangements.

5. Fiscal Structure and HDI

First of all it is interesting to check the existent relationship between the three HID. Table 4 depicts the correlations beteween those variables. All the correlation are higth and significant as it would be expected. However It is of note the fact that correlations between health and education HDIs are closer than the ones relating those two variables and the income HDI.

Table 4.

Correlations[a]

		IDHE91	IDHL91	IDHR91	IDHE00	IDHL00	IDHR00
IDHE91	Pearson Correlation	1	,776**	,848**	,949**	,773**	,882**
	Sig. (2-tailed)	,	,000	,000	,000	,000	,000
IDHL91	Pearson Correlation	,776**	1	,759**	,759**	,917**	,792**
	Sig. (2-tailed)	,000	,	,000	,000	,000	,000
IDHR91	Pearson Correlation	,848**	,759**	1	,827**	,742**	,929**
	Sig. (2-tailed)	,000	,000	,	,000	,000	,000
IDHE00	Pearson Correlation	,949**	,759**	,827**	1	,754**	,870**
	Sig. (2-tailed)	,000	,000	,000	,	,000	,000
IDHL00	Pearson Correlation	,773**	,917**	,742**	,754**	1	,788**
	Sig. (2-tailed)	,000	,000	,000	,000	,	,000
IDHR00	Pearson Correlation	,882**	,792**	,929**	,870**	,788**	1
	Sig. (2-tailed)	,000	,000	,000	,000	,000	,

**. Correlation is significant at the 0.01 level (2-tailed).

a. Listwise N=5507

Two main decisions emerge from this fact. The first is that income HDI should be an important variable to explain the other two HDIs and second that other variables like the ones that compose fiscal structure should be capable to explain some of the health and education HDIs variation.

To explore the causalities that could exist between HDIs and fiscal variables it was estimated four linear regressions for each of the HDIs considered. Table 5 presents the results for education HDI and Table 6 for health HDI. The models use three kinds of variables: dummies for regions, income HDI (to control for wealth) and the fiscal variables. All the fiscal variables considered are from the year before HDIs were estimated supposing that the HDIs results for one year should mainly be explained by last year's patterns of fiscal structure. Another important remark to be done is that 2000 was local level year's election. So 2000 HDIs should reflect last mandates patterns of public budgets.

Table 5. Regressions Results
Education HDI

1

hdie91tritradr
Dependent Variable: IDHE91
Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Model	B	Std. Error	Beta		
(Constant)	0,222	0,011		20,428	0,000
DNO	-0,039	0,004	-0,068	-8,657	0,000
DNE	-0,085	0,003	-0,302	-25,598	0,000
DSU	0,033	0,003	0,099	12,248	0,000
DCO	-0,018	0,004	-0,038	-4,917	0,000
IDHR91	0,824	0,017	0,593	48,952	0,000
RECTRB0	0,044	0,017	0,023	2,574	0,010
RETRACO0	-0,004	0,007	-0,005	-0,591	0,555
R Square	0,786				

2

hdie00tritradr
Dependent Variable: IDHE00
Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Model	B	Std. Error	Beta		
(Constant)	0,364	0,010		35,115	0,000
DNO	0,003	0,003	0,008	1,112	0,266
DNE	-0,021	0,002	-0,106	-9,582	0,000
DSU	0,031	0,002	0,155	19,470	0,000
DCO	0,008	0,002	0,024	3,316	0,001
IDHR00	0,675	0,012	0,725	57,621	0,000
RECTRB9	0,056	0,014	0,043	4,004	0,000
RETRACO9	0,007	0,007	0,010	0,978	0,328
R Square	0,797				

3

hdie91desdr
Dependent Variable: IDHE91
Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Model	B	Std. Error	Beta		
(Constant)	0,232	0,012		19,593	0,000
DNO	-0,038	0,005	-0,067	-8,319	0,000
DNE	-0,086	0,003	-0,307	-25,728	0,000
DSU	0,040	0,004	0,122	9,858	0,000
DCO	-0,015	0,004	-0,032	-4,172	0,000
IDHR91	0,802	0,019	0,577	42,262	0,000
IPTU0	0,086	0,046	0,014	1,852	0,064
ISS0	0,148	0,039	0,030	3,790	0,000
FPM0	-0,004	0,007	-0,006	-0,543	0,587
COTICMS0	0,007	0,009	0,008	0,711	0,477
OUTRES0	-0,056	0,015	-0,036	-3,792	0,000
OUTRCOR0	-0,002	0,008	-0,003	-0,256	0,798
R Square	0,788				

4

hdil00desdr
Dependent Variable: IDHE00
Coefficients

Model	Unstandardized Coefficients		Standardized Coe t		Sig.
Model	B	Std. Error	Beta		
(Constant)	0,413	0,011		38,219	0,000
DNO	0,001	0,003	0,002	0,224	0,823
DNE	-0,021	0,002	-0,106	-9,067	0,000
DSU	0,032	0,002	0,163	20,667	0,000
DCO	0,005	0,002	0,015	1,988	0,047
IDHR00	0,601	0,014	0,645	43,669	0,000
IPTU9	0,052	0,024	0,020	2,170	0,030
ISS9	0,180	0,026	0,055	6,884	0,000
FPM9	0,004	0,007	0,007	0,545	0,586
COTICMS9	0,049	0,009	0,062	5,308	0,000
OUTRES9	-0,004	0,021	-0,001	-0,197	0,844
OUTRCOR9	-0,018	0,016	-0,009	-1,142	0,254
FUNDEF9	-0,101	0,013	-0,076	-8,091	0,000
SUS9	0,067	0,015	0,034	4,335	0,000
OUTRUN9	0,016	0,013	0,010	1,175	0,240
COIPVA9	-0,033	0,046	-0,006	-0,723	0,469
FUNDEST9	-0,099	0,013	-0,065	-7,749	0,000
SUSES9	0,036	0,049	0,005	0,750	0,453
R Square	0,807				

Table 6. Regressions Results
Health HDI

1

hdil91tritradr
Dependent Variable: IDHL91
Coefficients

Model	Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.
(Constant)	0,43	0,009		50,452	0,000
DNO	-0,05	0,004	-0,128	-13,349	0,000
DNE	-0,07	0,003	-0,381	-26,312	0,000
DSU	0,02	0,002	0,081	8,220	0,000
DCO	-0,04	0,003	-0,124	-13,177	0,000
IDHR91	0,44	0,013	0,494	33,263	0,000
RECTRB0	-0,05	0,013	-0,043	-3,970	0,000
RETRACO0	-0,01	0,005	-0,019	-1,971	0,049
R Square	0,68				

2

Coefficients
Dependent Variable: IDHL00

Model	Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.
(Constant)	0,403	0,012		33,047	0,00
DNO	-0,030	0,004	-0,087	-8,681	0,00
DNE	-0,035	0,003	-0,201	-13,760	0,00
DSU	0,012	0,002	0,067	6,422	0,00
DCO	-0,021	0,003	-0,072	-7,429	0,00
IDHR00	0,550	0,014	0,662	39,927	0,00
RECTRB9	-0,117	0,017	-0,099	-7,031	0,00
RETRACO9	-0,003	0,009	-0,004	-0,345	0,73

3

hdl91desdri
Dependent Variable: IDHL91
Coefficients

Model	Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.
(Constant)	0,45	0,009		48,991	0,000
DNO	-0,05	0,004	-0,132	-13,725	0,000
DNE	-0,07	0,003	-0,386	-26,939	0,000
DSU	0,02	0,003	0,088	5,898	0,000
DCO	-0,04	0,003	-0,126	-13,666	0,000
IDHR91	0,41	0,015	0,460	28,022	0,000
IPTU0	-0,11	0,036	-0,028	-2,966	0,003
ISS0	-0,10	0,030	-0,033	-3,470	0,001
FPM0	-0,02	0,005	-0,041	-3,007	0,003
COTICMS0	0,01	0,007	0,010	0,698	0,485
OUTRES0	-0,10	0,011	-0,100	-8,849	0,000
OUTRCOR0	0,02	0,007	0,049	3,025	0,003
R Square	0,69				

4

hdil00desdr
Dependent Variable: IDHL00
Coefficients

Model	Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.
(Constant)	0,41	0,01		31,65	0,00
DNO	-0,02	0,00	-0,07	-6,69	0,00
DNE	-0,03	0,00	-0,15	-9,55	0,00
DSU	0,01	0,00	0,07	6,23	0,00
DCO	-0,02	0,00	-0,07	-7,10	0,00
IDHR00	0,53	0,02	0,64	32,17	0,00
IPTU9	-0,09	0,03	-0,04	-3,12	0,00
ISS9	-0,15	0,03	-0,05	-4,88	0,00
FPM9	0,02	0,01	0,04	2,40	0,02
COTICMS9	0,01	0,01	0,02	1,34	0,18
OUTRES9	-0,03	0,02	-0,01	-1,19	0,23
OUTRCOR9	-0,02	0,02	-0,01	-1,10	0,27
FUNDEF9	-0,10	0,01	-0,09	-6,75	0,00
SUS9	-0,03	0,02	-0,02	-1,78	0,08
OUTRUN9	-0,05	0,02	-0,03	-2,87	0,00
COIPVA9	0,04	0,05	0,01	0,71	0,48
FUNDEST9	-0,04	0,02	-0,03	-2,32	0,02
SUSES9	0,00	0,06	0,00	0,06	0,95
R Square	0,66				

The first model employs only the two most aggregated levels of current revenues: taxes and transferences. The idea of first introducing only these two variables was to ascertain if they would be significant in explaining HDI variation by themselves or not. Taxes revenues for 1990 and 1999 (RECTRB0 and RECTRB9) are significant and have the expected positive sign. It indicates that the effort to collect seems to have positive effects on the delivery of public education services as HDI increases with higher budget shares of taxes revenues. It is also interesting to

observe that in 1999 the influence of taxes revenue on HDI education were stronger than in 1990 signifying that the above mentioned effect should have acquired a larger influence on HDI education. On the other hand transferences from federal and state levels to local level (RETRACO0 and RETRACO9) were not significant and also 1990 transferences had a negative sign. As expect the proxy for municipio affluence HDIR was highly significant and its coefficient was the most powerful one. However the fact that taxes revenues entered the regression significantly implies that income is not the sole variable to explain education HDI variation. The dummies for regions also were all significant and showed the right signs.

To explore a little further the information it was estimated the second model for education HDI where fiscal variables were disaggregated. Both transferences and taxes now assume their original source. For 1990 we have two taxes sources: property (IPTU0) and services (ISS0), and four transferences items: federal local participation fund (FPM0), participation on state vat tax (COTICMS0), other state transferences (OUTRES0) and current transferences from other sources (OUTRCOR0). In 1999 we have the new transferences that were created to implement the decentralization process. So for this year there is other four new items that stand for: the federal education fund (FUNDEF9), the federal health fund (SUS9), the state education fund (FUNDEST9) and the state health fund (SUSES9). In addition for this year there other two items witch where in existence in 1990 but did not appear on the budget for that year: other federal transferences (OUTRUN9) and the local participation on state vehicle property tax (COIPVA9).

Again for both years the single most important variable was income HDI. Following we have the regional dummies with their correct signs. In 1990 three out of four fiscal variables were significant. They were: property tax (IPTU0) services taxes (ISS0) and other state transferences (OUTRES0). Both local level taxes have positive signs confirming the result of the first regression. The other significant variable had a negative signal implying that it does not have a favorable impact on

education HDI. The other three transferences were not significant and with the exception of participation on state vat tax (COTICMS0) they exhibited negative signs.

In 1999 the picture changed a little. Only two of three variables witch were significant in 1990 maintained the same result with the same signal (IPTU0 and ISS0). They are taxes variables. The transference that were significant in 1990 (OUTRES0) is not any more in 1999 but the sign was maintained. Of the three that were non significant in 1990 two continue to be (FPM9 and OUTRCOR9) while COTICMS0 became significant and favorable to education HDI improvement. Among the variables that exist only for 1999 there are three non-significant and other three significant. The significant ones were: FUNDEF9, FUNDEST9 and SUS9. The first two are to be the specific purpose transferences for education and it is astonishing that they are significant but with a negative sign indicating that increases in these funds shares caused decrease in education HDI. As it was pointed before at least 60% of these funds are to be spent on teachers´ wages. It is possible to imagine that the teachers that are being hired could not be the best people to take the job. On April 11, 2004 one of the most influent Brazilian newspaper “O Estado de São Paulo” publish that Federal Public Ministry3 estimates that only 25% of FUNDEF was correctly utilized. The news brought evidence of prefeitos´4 relatives being hired, of firms specialized on faking sales to municipios and so on. Brazilian newspapers have been publishing a lot of material about these occurrences. 34 prefeitos have been arrested following these investigations so far. Considering the size of the corruption that could exist in the use of these funds the results obtained could be not so astonishing. Actually what the regressions may be showing is that these kind transferences when their use

[3] Public Ministry is the public unit responsible to investigate denounces about public misconduct.

[4] Prefeitos are the local executive chiefs.

could not be properly monitored may most probably be damaging for the purpose they were created.

Also SUS9 was significant but in this case the sign is positive. This is wear too because this transference is the one intended to improve health care services and not education. Lastly the remaining three transference variables (SUSES9, OUTRUN9 and COIPVA9) were not significant. It is worthwhile mentioned that the regression for education HDI 2000 exhibited a higher R square than the one for 1991.

Turning our attention to health HDI it is possible to observe that the results for these variables are not as consistent as for education HDI. Again in all the models the regional dummies and income HDI continue to be significant and to present the correct sign. In the first model were only transferences revenues were not significant in both years. Taxes revenues were significant however the sign was contrary to expected.

When the disaggregate variables are considered again it is possible to observe the same strange pattern. In 1991 the variables that explained health HDI were: IPTU0, ISS0, OUTRES0 and OUTRCOR0. Only one variable COTICMS0 was not significant. Among the significant ones only one OUTRCOR0 was favorable to increases in health HDI. In this case like in the former model taxes revenues did not favor health HDI amelioration. Contrary to the result for education HDI strengthening efforts to collect taxes at local level do not have a positive impact on health HDI.

When we look at the results for 2000 health HDI the picture does not turn clearer. The same results obtained for 1991 stand for four variables: IPTU9, ISS9, FPM9 and COTICMS9. OUTRES9 and OUTRCOR9 turn to be not significant. In respect to those variables that did not existed on 1990 budget we had four significant and two non significant. All the significant ones have negative signs indicating that these transferences have a negative impact on health HDI. It is strange to observe

that among those four we find SUS9 that is the transference specific to health care services.

In the case of health HDI it is not possible to conclude that the fiscal variables could have any positive impact.

6. Concluding remarks

Brazilian federalism went to significant changes along the 90´s. Some of these changes were intended to improve public services especially education and health for what there have been created specific funds as described on a previous section. On the other hand Brazilian HDI along the 90´s exhibited significant changes like meaningful increases and also diminishing differences between regions.

Some hypotheses were putted forward in this paper concerning the relationship between changes in federalism rules and shifts on HDI. The first one was that the changes should improve public services by introducing new monitoring mechanisms. In fact the changes provided local administrations with resources that otherwise would not be available. The share of transferences increased along the 90´s however these increases did not proved to be favorable to increases in HDIs. The estimated regressions results disclosed generally negative relations between transferences and HDIs. One of the reasons for these results could be that the monitoring mechanisms introduced were not as effective as they should be and did not actually offer the enforcement for right resources use.

This could indicate that these transferences being earn market limit local government autonomy and hinder local governments capacity to develop policies suitable to local conditions. This hypothesis acquires strength if it is associated to the result that taxes transferences were generally significant to explain education HDI and showed the expected signs. However there could be another hypothesis to be considered. It may be that accountability in respect to taxes raised at local level is greater than for transferences. Considering education HDI this hypothesis

finds some support in both years once the coefficients for taxes variables were significant and depicts the right signs. However for health HDIs the same results did not hold.

Considering the results obtained it is not possible to affirm that changes in federal transferences have the potential to diminishing regional disparities. The main hypothesis suggested in this paper was that the greater control by federation over the delivery of local public services may improve public services quality as a whole but does not necessarily favors the convergence on living conditions between regions. According to our results not even this hypothesis holds. The decrease in HDIs regional disparities should be looked after somewhere else and we need a better understanding of the reasons why changes fiscal structure could not respond to population needs.

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